

EXHIBIT A

GEORGIA, MUSCOGEE COUNTY

SUPERIOR/STATE COURT

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DANIELLE F. FORTE, CLERK

General Civil Case Filing Information Form (Non-Domestic) Court Superior StateCounty MuscogeeDocket # SU-19-CV-643-06Date Filed 03/11/2019MM-DD-YYYY**Plaintiff(s)**Cannon, Sterling 13823430

Last First Middle I. Suffix Prefix Maiden

Cannon, Heather 13823448

Last First Middle I. Suffix Prefix Maiden

Last First Middle I. Suffix Prefix Maiden

Last First Middle I. Suffix Prefix Maiden

No. of Plaintiffs 2Plaintiff/Petitioner's Attorney Pro SePeter H. Strott 13085854

Last First Middle I. Suffix

Bar # 689150**Check Primary Type (Check only ONE)**

- Contract/Account
- Wills/Estate
- Real Property
- Dispossessory/Distress
- Personal Property
- Equity
- Habens Corpus
- Appeals, Reviews
- Post Judgement Garnishment, Attachment, or Other Relief
- Non-Domestic Contempt
- Tort (If tort, fill in right column)
- Other General Civil Specify _____

**If Tort is Case Type:
(Check no more than TWO)**

- Auto Accident
- Premises Liability
- Medical Malpractice
- Other Professional Negligence
- Product Liability
- Other Specify _____

Are Punitive Damages Pleaded? Yes No

- I hereby certify that the documents in this filing (including attachments and exhibits) satisfy the requirements for redaction of personal or confidential information in O.C.G.A. 9-11-7.1.

GEORGIA, MUSCOGEE COUNTY
SUPERIOR/STATE COURT
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3/12/2019 4:50 PM
DANIELLE F. FORTE, CLERK

IN THE SUPERIOR COURT OF MUSCOGEE COUNTY
STATE OF GEORGIA

STERLING CANNON and HEATHER)
CANNON,)
Plaintiffs,) CIVIL ACTION
v.) FILE NO.: SU-19-CV-643
FOAMONE, L.L.C.,)
Defendant.)

SUMMONS

TO THE ABOVE NAMED DEFENDANT:

You are hereby summoned and required to file with the Clerk of said Court and serve upon the Plaintiff's counsel, whose name and address is:

Peter H. Strott, Esq.
Strott & Dillon, LLC
Five Concourse Parkway, Suite 2600
Atlanta, GA 30328

an answer to the complaint which is herewith served you, within 30 days after service of this summons upon you, exclusive of the day of service. If you fail to do so, judgment by default will be taken against you for the relief deemed in the complaint.

This 12th day of March, 2019.

By: _____ /s/ Adrienne Reid
deputy Clerk of Court
Muscogee County Superior Court

IN THE SUPERIOR COURT OF MUSCOGEE COUNTY
STATE OF GEORGIA

STERLING CANNON and HEATHER) CANNON,)))
Plaintiffs,)	CIVIL ACTION
)	FILE NO.:
v.)	SU-19-CV-643
FOAMONE, L.L.C.,)	
)	
<u>Defendant.</u>)	

COMPLAINT

Plaintiffs Sterling Cannon and Heather Cannon (together the "Plaintiffs" or the "Cannons") hereby bring this action against Defendant FoamOne, L.L.C. and for their Complaint say as follows:

JURISDICTION AND VENUE

1.

Plaintiffs are the homeowners of a house and real property located at 8707 Grey Rock Road, Midland, Georgia 31820, in Muscogee County (the "House").

2.

Defendant FoamOne, L.L.C. ("FoamOne") is an Alabama limited liability company located in Lee County, Alabama and which may be served with process by service upon its registered agent Dale E. Looney at the office of its registered agent at 679 Highland Rd., Auburn, Alabama 36830.

3.

This Court has jurisdiction over the subject matter of this action and over the parties to this action.

4.

Venue of this action is proper in this Court.

5.

All conditions precedent to this action have been satisfied, met, performed, waived or rendered futile.

BACKGROUND FACTS

6.

In early 2018, the Cannons contacted FoamOne requesting assistance and cost proposals for installation of spray foam insulation in their House. FoamOne, through its advertising, literature, and oral communications, represented to the Cannons that it was capable of providing suitable materials and properly installing spray foam insulation in the Cannons' House.

7.

FoamOne knew or should have been known that composite wood, which can emit formaldehyde, was present in the Cannons' House. FoamOne did not disclose to the Cannons that the foam insulation, which would totally seal the House, would trap any formaldehyde emitted from the composite wood and create unsafe levels of formaldehyde in the House.

8.

FoamOne provided the Cannons with a proposal to install spray foam insulation in the Cannons' House, and the Cannons accepted the proposal to create a contract. On July 16, 2018,

FoamOne issued an invoice to the Cannons for the installation. A true and correct copy of this invoice is attached hereto as **Exhibit “A.”**

9.

The Contract included, among other obligations, express and/or implied obligations that all work would be done in a good and workmanlike manner, that all materials installed would be suitable for the House, and that the spray foam installation would be fit for the intended purpose.

10.

On or about July 11th, 2018, FoamOne’s crew came to the Cannons’ House to begin installation of the spray foam insulation in the Cannons’ sunroom.

11.

The Cannons moved their family out of the house from July 11th-13th to accommodate the installation.

12.

FoamOne’s crew began the installation but failed to turn off the air conditioning in the house during the installation.

13.

Over the course of July 12th-13th, FoamOne continued the installation of the spray foam in the remainder of the house.

14.

FoamOne’s crew informed the Cannons that the ambient temperature in the attic was at least 140 degrees Fahrenheit during the installation, which the Cannons later learned to be 20 degrees higher than the recommended application *surface* temperature per the SES foam Technical Data Sheet (SES TDS_05lb.pdf).

15.

The application surface (the roof deck) was much hotter than the ambient temperature inside the attic. Minimal ventilation was set up during the installation.

16.

FoamOne told the Cannons they could return to the house 24 hours after the insulation was completed.

17.

On July 14th, the Cannons returned to the House and noticed a strong odor.

18.

The odor was so overwhelming that the Cannons experienced eye irritation, breathing difficulties, and burning lungs while inside the House.

19.

Sterling Cannon set up a system to ventilate the House and left the House open with fans running.

20.

Due to concerns over the odor, Heather Cannon ordered a Catureiss air quality tester.

21.

On July 16th, the Cannons notified Travis Smith ("Travis")—a FoamOne representative and the Cannons' primary point of contact—of the persistent odor in the House; however, Travis stated the odor was normal and assured them it was safe to re-enter the house.

22.

On July 18th, the Cannons moved back into the House, but a strong odor persisted.

23.

The Cannons then used the Catureiss air quality tester to measure the Volatile Organic Compounds ("VOCs") and formaldehyde in the air in the house.

24.

At 8:20 p.m. on July 18th, the Cannons measured formaldehyde levels at 2.316 mg/m³ (1.89 ppm) and VOC levels at 8.995 mg/m³ inside the House.

25.

Unaware of the significance of these numbers, and with the reassurance of FoamOne that the normal time to reoccupy the house was after 24 hours, the Cannons (including their 8-week-old daughter) slept overnight in a house where the formaldehyde concentration was high enough to increase the risk of nasopharyngeal cancer (>1ppm) and was close to the OSHA limit for 15 min exposure (2ppm).

26.

On July 20th, due to the concerns with the levels of VOCs and formaldehyde found in the House, the Cannons moved back out of the House.

27.

The Cannons notified Travis and FoamOne of the persistent odors and VOC / formaldehyde levels.

28.

The VOCs were being emitted from the spray foam insulation (a process known as "off-gassing").

29.

FoamOne recognized that persistent odors and VOC/formaldehyde levels were abnormal and explored various ideas for mitigating these issues, including increased ventilation, the use of air scrubbers, removal of the spray foam insulation to the extent possible, and spraying “closed cell” foam insulation over any “open cell” foam insulation which could not be removed, to seal off any more off-gassing.

30.

The removal of the spray foam insulation and covering the same with “closed cell” was presented to the Cannons as a remediation proposal on July 26th. A true and correct copy of the Remediation Proposal is attached hereto as **Exhibit “B”**.

31.

Ultimately, however, the Remediation Proposal did not guarantee that it would successfully mitigate the odors and VOC/formaldehyde levels and even acknowledged that the proposed remediation could result in *higher* levels of VOCs or other compounds in the air.

32.

Because the air conditioning had been run during the installation, VOCs would still be present in that system and in the walls of the House.

33.

Further, the Cannons would still be required to disclose the toxic VOCs and formaldehyde issues if they ever put the house on the market for sale, which would make it unsellable or severely diminish its value.

34.

The Remediation Proposal asked the Cannons to agree that after the proposed steps were completed by FoamOne, “all work [would be] complete and final,” thus releasing FoamOne from any further liability for the issues caused by FoamOne’s installation.

35.

The Cannons rejected the Remediation Proposal because of the unacceptable terms and conditions.

36.

On November 19, 2018, the Cannons obtained a Volatile Organic Compound Air Test of the House from Indoor Environmental Engineering, the results of which were memorialized in a report produced December 7, 2018 (the “Report”). A true and correct copy of the Report is attached hereto as **Exhibit “C.”**

37.

The Report showed that the spray foam insulation (which sealed the House) caused formaldehyde emitted from composite wood in the House to accumulate in dangerous levels in the air.

38.

The Report also showed that the spray foam insulation itself was emitting VOCs known as *allyl chloride* and *BDMAEE*, which had also accumulated in dangerous levels in the air in the House.

39.

Upon information and belief, the reason the spray foam insulation is emitting allyl chloride and BDMAEE is because it was installed incorrectly with the ambient temperature during

installation at 140 F or greater, which is far greater than the allowable 120 F temperature for proper installation.

40.

In addition, because the air conditioning was negligently left on during the installation, the allyl chloride and BDMAEE in the foam were further spread throughout the House.

41.

The Cannons have suffered damages as a result of FoamOne's breach of contract and negligent installation of the spray foam insulation in an amount to be proven at trial.

42.

Given the enormous expenses that would be incurred with attempts at remediation and reconstruction of the House, the House cannot be repaired and must be demolished and rebuilt.

43.

In addition to the loss of the full value of their home, the Cannons have also incurred other damages, including (1) costs from three moves they have had to make; (2) the rent and utilities they are having to pay for the unoccupied House; (3) the health risk to their family, particularly their then 8-week-old daughter from exposure to the VOCs/formaldehyde when FoamOne advised them to return home on Day 3; (4) the cost of environmental testing; and (5) the legal fees they have incurred and are continuing to incur to remedy this situation.

44.

FoamOne has refused to compensate the Cannons for these damages.

COUNT I
BREACH OF CONTRACT

45.

Plaintiffs reincorporate the allegations in Paragraph 1 through 44 of the Complaint as if set forth fully herein.

46.

FoamOne breached the Contract with the Cannons by, among other things:

- (a) failing to provide suitable materials for the installation of the spray foam insulation;
- (b) failing to perform the installation work in a good and workmanlike manner;
- (c) failing to perform the installation in accordance with the applicable industry standards, manufacturer requirements, building codes, laws or regulations;
- (d) by damaging the House and other property of the Cannons in connection with the installation;
- (e) by failing to notify the Cannons that the spray foam insulation FoamOne recommended was not safe for their home due to the risk of composite wood in the House emitting formaldehyde;
- (f) by failing to provide skilled personnel in connection with installation of the spray foam and failing to provide adequate supervision of the installation work; and
- (g) by failing or refusing to timely and properly diagnose the existence and/or cause of excessive VOC / formaldehyde levels in the House, allowing further damage to the Cannons and their property.

47.

The breaches by FoamOne were the direct and proximate cause of damages to the Cannons in an amount to be proven at trial.

48.

Despite repeated demands from the Cannons, FoamOne has failed and refused to compensate the Cannons adequately for the extensive damages that they have incurred and continue to incur.

49.

FoamOne is liable for the full amount of the damages incurred by the Cannons on account of its breaches of the Contract in an amount to be proven at trial.

COUNT II
NEGLIGENT INSTALLATION, SUPERVISION, AND FAILURE TO WARN

50.

Plaintiffs reincorporate their allegations in Paragraphs 1 through 49 of the Complaint as if set forth fully herein.

51.

Defendant FoamOne had a duty to provide suitable components for the spray foam insulation that were adequate for their intended purpose and that would work suitably with the existing structure(s) of the Cannons' House.

52.

FoamOne had a duty to properly install the spray foam insulation and to warn the Cannons of any risks which might arise from the installation of the spray foam insulation.

53.

FoamOne had a duty timely and properly to diagnose the existence and/or cause of excessive VOC / formaldehyde levels in the House following the defective installation.

54.

FoamOne acted negligently and/or recklessly in their selection of materials and recommendation of spray foam insulation in the Cannons' House; in their installation of the spray foam at the incorrect ambient temperature and while the air conditioning was still running; in their failure to warn the Cannons of the accompanying risks; and in their assurances to the Cannons that the House was safe to occupy even with the excessive levels of formaldehyde and VOCs present.

55.

FoamOne had a duty to install the foam spray insulation in a fit and workmanlike manner and to exercise that degree of care and skill as is ordinarily employed by other foam spray insulation companies under similar conditions and like circumstances.

56.

FoamOne breached its duty to provide the foam spray insulation installation in a fit and workmanlike manner, breached its duty to comply with the applicable standard of care and breached its duty to comply with the product manufacturer's installation instructions, and instead performed the work negligently, recklessly and/or with gross negligence.

57.

FoamOne had a duty to provide adequate supervision of its agents and employees while performing spray foam insulation installation work at the House.

58.

FoamOne was negligent in failing to supervise properly the agents or workers who performed installation tasks at the House, which resulted in defective and faulty work and left the House in an unsafe and unsuitable condition that was no longer habitable.

59.

After the initial installation, the Cannons notified FoamOne of the excessive and persistent odor, and FoamOne failed to perform a thorough and timely investigation and failed to diagnose properly the existence and cause of the excessive VOC / formaldehyde levels, resulting in additional damages to the Cannons.

60.

As a result of the breaches as alleged herein, the Cannons have incurred general, consequential, special, and other damages including but not limited to property damage and personal injuries for which they are entitled to recover damages in an amount to be proven at trial.

COUNT III
EXPENSES OF LITIGATION INCLUDING ATTORNEYS' FEES

61.

Plaintiffs reincorporate the allegations in Paragraphs 1 through 60 of the Complaint as if set forth fully herein.

62.

Defendant(s) have acted in bad faith, have been stubbornly litigious and/or have caused Plaintiffs unnecessary trouble and expense, thereby entitling Plaintiffs to recover their expenses of litigation including reasonable attorneys' fees, pursuant to O.C.G.A. § 13-6-11.

WHEREFORE, Plaintiffs respectfully request the following relief from the Court:

- i. That summons issue requiring Defendants to appear as provided by law to answer this Complaint;
- ii. That Plaintiffs have a trial by jury as to all counts of the Complaint;
- iii. That Plaintiffs recover all damages, including but not limited to, compensatory, general, consequential, and special damages from

Defendants in an amount to be determined by the enlightened conscience of a fair and impartial jury;

- iv. That Plaintiffs be awarded their reasonable attorneys' fees, costs and other expenses of litigation; and
- v. Such other and further relief as the Court deems just and proper.

Respectfully submitted this 11th day of March, 2019.

STROTT & DILLON, LLC

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FoamOne

Spray Foam Insulation



New Construction



Residential Retrofit



Commercial Industrial

P.O. Box 238 Auburn, AL 36831

P.O. Box 238

Auburn, AL 36831

P: (334)502-8744 • F: (334)502-5012

DATE

07/16/2018

INVOICE #

PPM2026

SU-19-CV-643



Member



National Association of Home Builders

CLIENT
Sterling Cannon

JOB
Foam Roofline 8707 Grey Rock Rd Columbus, GA

P.O. #	TERMS	DUE DATE	REP	JOB #
	C.O.D.	07/16/2018	Travis Smith	1607097912

****** Phase: Spray Foam ********Work Area**

Pump House Roofline
Pump House Walls
Roofline
Knee Walls
Ceiling
Roofline

Material

Closed Cell Foam Insulation 2"AVG
Closed Cell Foam Insulation 2"AVG
Open Cell Foam Insulation 5.5"AVG
Open Cell Foam Insulation 3.5"AVG
Insulation Removal Blown
Closed Cell Foam Insulation 3"AVG

Phase Total: 9774.00

Balance Due: 9774.00

No coatings for foam included unless priced above! No bonds included unless priced above! Foam insulation depths are an averaged measurement! Contractor/Owner to supply all scaffolding material if needed! 100 AMP Power Single Phase Within 100 Feet of Job ALL PRICES TO BE CONFIRMED BEFORE WORK BEGINS All material is guaranteed to be as specified, and the above work to be performed in accordance with drawings and specifications submitted for above work and completed in substantial workmanlike manner. Any alterations or deviations from above specifications involving extra cost will be executed upon verbal order, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. FoamOne, LLC reserves the right to adjust all estimated prices in the event of shortages, environmental impacts, freight surcharge increases, or environmental regulations

* Trash will be removed from job site and put in a CUSTOMER PROVIDED DUMPSTER. If no dumpster is provided, trash will be left in garage or removed by FoamOne, LLC for an additional charge.

* Price includes caulking all plates and applying can foam around all windows and doors.

* All open cell and closed cell spray foam insulation is required to be coated with an ignition barrier on all exposed foam in attics unless foam material has passed Appendix X of AC377 fire test. If decking is present for storage, a thermal barrier will be required. This estimate assumes that the foam plastic will be separated from the building interior with a 15 minute thermal barrier as outlined in AC 377 Acceptance Criteria for Spray Applied Foam Plastic Insulation.

* Spray foam insulation will create an extremely tight building envelope. A licensed HVAC contractor should perform a detailed manual J load calculation to determine the required sizing of HVAC equipment and fresh air requirements. Combustion appliances such as furnaces and gas water heaters located inside the building envelope will require fresh air for proper combustion. Please consult with licensed HVAC and Plumbing contractor for venting and combustion air requirements. Spray Foam Houses usually require fresh air for acceptable indoor air quality!

FoamOne is only responsible for applying Thermal Insulation. Any additional steps needed to satisfy building codes will be the sole responsibility of the builder and/or owner.

Phone (334)502-8744 ~ Fax (334)502-5012 ~ Web: www.foamone.net ~ Email: sales@foamone.net

Thank you for choosing FoamOne!

EXHIBIT

A

FoamOne

Spray Foam & Fiberglass Insulation

New
ConstructionResidential
RetrofitCommercial
Industrial

Agreement between Sterling Cannon Family and FoamOne, LLC.
Job address 8707 Grey Rock Road Midland, GA

FoamOne has offered to remove the open cell foam as much as possible and blow loose fill fiberglass back on the ceiling as the house was originally but the owner prefers FoamOne to spray closed cell back in the place of the open cell foam.

FoamOne agrees to remove the open cell insulation in the attic as much as possible and replace it with closed cell insulation at an average depth of 3" under the roof deck, coat the rafters with an average depth of 1" closed cell and spray knee walls with 2" of closed cell foam.

While installing the foam we will cross ventilate the attic and have a Manufacture representative present. All houses are different so sometimes they need to be ventilated more than others.

In this process we encapsulate the attic so there is less air exchanges in the house. If there are any items in the house that give off gas or other odors they will not be able to escape as before so it is possible that you could smell things that you didn't smell before or have higher amount of VOC's or other compounds in the air.

Some people are more sensitive to odors than other people so we recommend that you review the SDS sheets for any chemical sensitivity.

FoamOne does not guarantee or represent that the owners will not be able to smell odors from the attic or other items in the house after encapsulating the attic.

After this work is completed by FoamOne all work is complete and final.

FoamOne, LLC Dale Looney Member

Sterling Cannon/Sterling Cannon Family

P O Box 238 Auburn, AL 36830
334.502.8744 www.foamone.net



GEORGIA, MUSCOGEE COUNTY
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SU-19-CV-643

**VOLATILE ORGANIC COMPOUND
AIR TESTING**

FOR

**8707 GREY ROCK ROAD
MIDLAND, GA**

Prepared by:

**Indoor Environmental Engineering
San Francisco, CA
(415) 567-7700**



Francis J. Offermann PE, CIH
President

December 7, 2018
(IEE File Reference P-4180)





INDOOR ENVIRONMENTAL ENGINEERING



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VOLATILE ORGANIC COMPOUND
AIR TEST

Subject. Volatile organic compound (VOC) air testing at the residence located at 8707 Grey Rock Road, Midland, GA.

Study Purpose: In July 2018, spray polyurethane foam (SPF) was installed in a residence located 8707 Grey Rock Road, Midland, GA. Following the installation of the SPF in the Attic, the owner reported experiencing an odor in the living space of the home, strongest in the Living Room/Sunroom. In addition, the owners reported experiencing eye irritation and breathing difficulties/burning lungs. As a result the owners moved out of the residence. The odor, eye irritation, and breathing difficulties/burning lungs have persisted, and were last experienced by the owners on December 2, 2018 when they returned to the home to pick up some things, more than 4 months since the SPF installation.

Indoor Environmental Engineering was contacted to conduct air testing for volatile organic compounds (VOCs) in the residence and chemical emission rate testing of a sample of the installed SPF.

Home Configuration. The day before the air test, all windows and doors to the residence were closed and the forced air heating/cooling system was run in the normal operational mode, and all temporary ventilation systems were removed and any associated outdoor openings sealed.

SPF Description. There were two types of SPF installed in the home; one in the Attic on July 12-13, 2018 on the underside of the roof, and one in the Sunroom on July 11, 2018 on the underside of the roof, and covered with painted gypsum wallboard, and separated from the Attic and main living space.

The SPF installed in the Attic was SES Foam, Sucraseal, a 0.5 lb/ft³ open cell two part polyurethane spray foam. The outdoor air temperatures on the installation dates was hot (75 °F to 94 °F), and according to the owner the workers reported that the air temperature in the attic was 140 °F. SES Foam recommends that "surfaces receiving application of SES Foam 0.5 lb Spray should be between 50 and 120 °F. Colder or hotter surfaces may affect yield, density and other physical properties". The owner also reported that the forced air heating/cooling system, which is located in the Attic, was left operating during the application of the SPF in the Attic.

The SPF applied to the underside of the roof in the Attic is depicted in Figure 1.

The SPF installed in the Sunroom ceiling was SES Foam, Nexseal 2.0, a 2.0 lb/ft³ closed cell two part polyurethane spray foam. The outdoor air temperatures on the installation date was hot (77 °F to 97 °F). SES Foam says that Nexseal 2.0 "is designed to be used in ambient temperatures

from -40 °F to 180 °F, 220 °F intermittent".

Following installation of the SES Foam Sucraseal in the Attic, and the reports of odors and irritation, the owner and builder installed temporary exhaust fans in the Attic. These exhaust fans were removed the day before the air test.

The Safety Data Sheets (SDS) for the A and B components of Sucraseal indicate the following chemicals.

A - Component

Polymethylene polyphenyl isocyanate (CAS# 9016-87-9), 30-70% W/W
4,4'-Methylenediphenyl diisocyanate (CAS# 101-68-8), 30-70% W/W

B - Component

Chlorinated phosphate ester (Trade Secret), 20-25% W/W
Proprietary amines (Trade Secret), 3-15% W/W
Surfactant (Trade Secret), 1-5% W/W
Polyol resin (Trade Secret), < 40%
Proprietary silicone polymer (Trade Secret), < 2%
Water (CAS# 7732-18-5), < 30%

The manufacturer, SES Foam, further clarified that the undisclosed chlorinated phosphate ester is tris(1-chloro-2-propyl)phosphate (TCPP), a fire retardant, and that the proprietary amine is bis(2-(dimethylamino)ethyl)ether (BDMAEE).

The Safety Data Sheets (SDS) for the A and B components of Nexseal 2.0 indicate the following chemicals.

A - Component

Polymethylene polyphenyl isocyanate (CAS# 9016-87-9), 30-70% W/W
4,4'-Methylenediphenyl diisocyanate (CAS# 101-68-8), 30-70% W/W

B - Component

Proprietary polyols (Trade Secret), 5-20% W/W
Surfactant (Trade Secret), 1-5% W/W
Ethylene glycol (CAS# 107-21-1), 1-5%

SPF Chemical Emission Rate Measurements. We collected a core of the SES Foam Sucraseal installed in the Attic and wrapped it in two layers of heavy duty aluminum foil and shipped the sample to Berkeley Analytical Associates, an ISO/IEC 17025 accredited laboratory, for chemical emission rate testing for volatile organic compounds (VOCs) according to ASTM D7706-17. No sample of the SES Foam Nexseal 2.0 installed in the Sun Room ceiling was collected, as it was sealed between the roof and the Sun Room ceiling and thus not readily accessible.

A 0.78 gram sample of the SPF, with an exposed surface area of 31.2 cm², was placed into the micro-scale stainless test chamber which was operated at 35 °C with a 50 ± 3 cc/min of ultra high purity air. The air-side surface of the sample was untrimmed and as it was installed in the home.

The emissions of 4 chemicals from the SPF sample were observed and are reported in Table 1.

- Acetic acid
- Allyl chloride
- Bis(2-(dimethylamino)ethyl)ether (BDMAEE)
- Tris(1-chloro-2-propyl)phosphate (TCPP)

BDMAEE and TCPP were confirmed by SES Foam as being contained in Sucraseal. Acetic acid, and allyl chloride are either contained in the foam ingredients or are reaction products.

Olfactory Assessment. Upon entry to the residence a chemical odor with a “sweet characteristic” was observed. This chemical was also observed in the Living Room/Sun Room and was strongest in the Attic where the SPF was installed.

Indoor Air Quality Measurements: We measured the concentrations of VOCs at three locations:

- Attic (above Living Room/Sun Room)
- Living Room/Sun Room
- Outdoors

Individual Volatile Organic Compounds. We measured the concentrations of individual volatile organic compounds, using a solid phase multi-sorbent collector that was thermally desorbed into a gas chromatograph with mass spectrometer detector for analysis. Sampling and laboratory analyses were conducted in a manner comparable to the methods described in EPA Method IP-1B, “Determination of Volatile Organic Compounds (VOC’s) in Indoor Air, Solid Adsorbent Tubes”.

We also measured the concentrations formaldehyde and acetaldehyde using sorbent cartridge samplers impregnated with 2,4-dinitrophenylhydrazine. Analysis is performed using a high performance liquid chromatograph with a UV detector. Sampling and laboratory analyses were conducted in a manner comparable to the methods described in EPA Method IP-6A, “Determination of Formaldehyde and Other Aldehydes in Indoor Air, Solid Adsorbent Cartridge”.

The outdoor air temperatures during the air sampling ranged from 66-71 °F and the relative humidity ranged from 48% to 56%. The indoor air temperatures ranged from 73-75 °F during the air sampling and the relative humidity ranged from 46% to 52%.

The results of the VOC measurements are summarized in Table 2 along with the recommended maximum concentrations.

The exposure guidelines utilized to establish the recommended maximum VOC concentrations are the following:

- Office of Environmental Health Hazard Assessment (OEHHA) Chronic Reference Exposure Levels. The Chronic Reference Exposure Level (CREL) is the preferred exposure guideline, as it

provides concentrations below which sensitive individuals in non-industrial indoor environments, such as offices, are not expected to experience non-cancer health effects.

- 1.0% of Cal/OSHA Permissible Exposure Level. For chemicals that do not have a CREL, then 1.0% of the Permissible Exposure Level (PEL) is utilized as determined from a comparison of chemicals that have both CREL and PEL exposure guidelines.
- 0.5% of Department of Energy (DOE) Protective Action Criteria -1. For chemicals that do not have a CREL or a PEL, then 0.5% of the Protective Action Criteria -1 (PAC-1) is utilized as determined from a comparison of chemicals that have both CREL and PAC-1 exposure guidelines.

The chemicals observed during chemical emission rate testing of the SES Foam, Sucraseal, SPF are highlighted in yellow.

A total of 37 chemicals with concentrations exceeding $2 \mu\text{g}/\text{m}^3$ were identified in the air samples. All four chemicals observed to be emitted from the sample of SPF tested in the micro-chamber were observed in the air of the Attic, and one of these, acetic acid, was also observed in the air of the Living Room/Sun Room.

Of the 37 chemicals identified in the analyses, a total of 26 chemicals have exposure guidelines. Two VOCs (bolded in Table 2) were observed to exceed the recommended maximum indoor concentrations at one or more locations, including one of the four VOCs emitted by the SPF. The one SPF chemical that exceeded exposure guidelines, bis(2-(dimethylamino)ethyl)ether (BDMAEE), exceeded the exposure guidelines by factors of 7.4 in the Attic.

The other non-SPF chemical that exceeded recommended exposure guidelines, is formaldehyde. The concentrations of formaldehyde in the Living Room/Sun Room, $29.2 \mu\text{g}/\text{m}^3$, and the Attic, $29.5 \mu\text{g}/\text{m}^3$, are typical of the concentrations in new homes (median of $36 \mu\text{g}/\text{m}^3$ and maximum of $136 \mu\text{g}/\text{m}^3$ in the California New Home Study - CNHS, <http://www.iee-sf.com/pdf/CEC-500-2009-085.pdf>). The concentrations of formaldehyde are most likely the result of composite wood products in the home (e.g. particleboard, medium density plywood, etc.).

We note that Danish Environmental Protection Agency has recently established in 2018, a DNEL (Derived No Effect Level) of just $2 \mu\text{g}/\text{m}^3$ for continuous exposure of BDMAEE. The health outcome identified for inhalation exposure to this chemical is mucous membrane irritation. This exposure guideline is lower than the $3.3 \mu\text{g}/\text{m}^3$ guideline extrapolated from occupational exposure guidelines and utilized in Tables 2 and 3. The concentration of BDMAEE in the Attic is 12 times the Danish Environmental Protection Agency DNEL of $2 \mu\text{g}/\text{m}^3$.

Conclusions. The following is a summary of our measurements at the residence located at 8707 Grey Rock Road, Midland, GA, on November 19, 2018.

A total of 37 chemicals with concentrations exceeding $2 \mu\text{g}/\text{m}^3$ were identified in the air samples. All four chemicals observed to be emitted from the sample of SPF tested in the micro-chamber were observed in the air of the Attic, and one of these, acetic acid, was also observed in the air of the Living Room/Sun Room.

A total of two VOCs were observed to exceed the recommended maximum indoor concentrations at one or more locations, including one of the four VOCs emitted by the SPF. The one SPF chemical that exceeded exposure guidelines, bis(2-(dimethylamino)ethyl)ether (BDMAEE), exceeded the US exposure guideline by a factor of 7.4 and the Danish exposure guideline by a factor of 12 in the Attic.

The emission rate of chemicals from the SPF applied to the underside of the roof is strongly influenced by the temperature of the exterior of the roof, with higher roof temperatures corresponding to higher chemical emission rates, and as a result higher indoor air concentrations. The temperature of the exterior of the roof is influenced by the outdoor air temperature and the duration and intensity of solar radiation onto the roof. Since the air concentrations of VOCs were measured on November 19, 2018, which was a day with relatively mild outdoor air temperatures (i.e. 44 °F to 71 °F) and with less solar radiation than during Summer months, the emission rates of SPF chemicals into the indoor air, and hence the indoor air concentrations, will be substantially higher during hot Summer days.

Based upon the measured chemical emission rates from the SPF and the amount of these compounds reported in the Safety Data Sheets, the emissions from the SPF are expected to persist more than 20 - 200 years.

The only mitigation that is guaranteed to eliminate all SPF chemical emissions into the Attic and living space air, is complete removal of all of the SPF along with the substrate to which the SPF was applied (i.e. Attic framing and roof deck).

The chemical emissions from the SPF applied to the Living Room/Sun Room have not been determined, and depending on the emission rates, this SPF, along with the substrate to which the SPF was applied (i.e. framing and roof deck) may also require removal.

Other mitigation options include:

- isolation of the SPF from the indoor air with installation of a low perm physical barrier over the SPF
- sealing all of the ventilation system ductwork and cabinets
- installation of exhaust air in the Attic to create a negative air pressure in the Attic with respect to the living spaces
- increasing the delivery of outdoor air to the residence

While these mitigation options can reduce the concentrations of SPF chemicals in the residence, they cannot eliminate the concentrations. The amount of reduction in the indoor concentrations that can be achieved by these mitigation measures is uncertain and is best determined by testing the air following the mitigation.



Figure 1. Photographs of polyurethane spray foam (SPF) applied to underside of the roof at 8707 Grey Rock Road, Midland, GA.

Table 1. Chemical emission rate measurements of volatile organic compounds (VOCs) from a core sample of SES Foam, Sucraseal, spray polyurethane foam (SPF) collected from the underside of the roof at the residence located at 8707 Grey Rock Road, Midland, GA, on November 19, 2018.

Chemical	CAS #	Area – Specific ^a Emission Factor ($\mu\text{g}/\text{m}^2\text{-h}$)
Acetic acid	64-19-7	12.5
Allyl chloride	107-05-1	25.7
Bis(2-(dimethylamino)ethyl)ether (BDMAEE)	3033-62-3	552 ^b
Hexamethylcyclotrisiloxane	541-05-9	7.3
Tris(1-chloro-2-propyl)phosphate (TCPP)	13674-84-5	46.2

a.) Area Specific Emission Factor Detection Limits: 10 $\mu\text{g}/\text{m}^2\text{-h}$ for VOCs other than formaldehyde and acetaldehyde, and 4.8 $\mu\text{g}/\text{m}^2\text{-h}$ for formaldehyde and 6.4 $\mu\text{g}/\text{m}^2\text{-h}$ for acetaldehyde.
 b.) Measured mass of Bis(2-(dimethylamino)ethyl)ether (BDMAEE) exceeded calibration range.

Table 2. Concentrations of individual volatile organic compounds measured at the residence located at 8707 Grey Rock Road, Midland, GA, on November 19, 2018.

Chemical	CAS #	Attic ($\mu\text{g}/\text{m}^3$)	Living Room / Sun Room ($\mu\text{g}/\text{m}^3$)	Outdoors ($\mu\text{g}/\text{m}^3$)	Recommended Maximum Concentration ($\mu\text{g}/\text{m}^3$)
Acetaldehyde	75-07-0	28.7	13.7	< 2	140 ^a
Acetic acid	64-19-7	41.1	26.9	< 2	250 ^b
Acetone	67-64-1	18.5	9.0	< 2	12,000 ^b
Allyl chloride	107-05-1	13.2	< 2	< 2	30 ^b
Benzaldehyde	100-52-7	5.7	4.9	2.0	85 ^c
Benzene	71-43-2	< 2	< 2	3.9	3 ^a
Bis(2-(dimethylamino)ethyl)ether (BDMAEE)	3033-62-3	24.5	< 2	< 2	3.3 ^b
1-Butanol	71-36-3	3.4	3.2	< 2	1,500 ^b
2-Butanone	78-93-3	2.8	< 2	< 2	5,900 ^b
2-Butoxyethanol	111-76-2	2.0	< 2	< 2	970 ^b
3-Carene	13466-78-9	3.4	3.7	< 2	NA
1-Chloro-2-propanol	127-00-4	6.0	2.4	< 2	NA
Decanal	112-31-2	3.1	< 2	< 2	55 ^c
Dichloromethane	75-09-2	< 2	< 2	5.0	400 ^a
Ethanol	64-17-5	5.2	3.6	< 2	19,000 ^b
2-Ethyl-1-hexanol	104-76-7	7.2	7.2	< 2	NA
Formaldehyde	50-00-0	29.5	29.2	< 1	9 ^a
Furfural	98-01-1	25.9	15.6	< 2	NA
Heptanal	111-71-7	3.4	< 2	< 2	NA
Hexanal	66-25-1	8.5	8.4	< 2	NA
Hexanoic acid	142-62-1	3.1	6.9	< 2	11 ^c
d-Limonene	5989-27-5	5.7	5.7	< 2	420 ^c
1-Methoxy-2-propanol	107-98-2	2.8	2.6	< 2	7,000 ^a
Methyl acetate	79-20-9	2.2	< 2	< 2	6,100 ^b
Methyl methacrylate	80-62-6	13.4	14.5	< 2	70 ^c
Nonanal	124-19-6	8.1	7.5	2.1	NA
Pentanal	110-62-3	6.4	6.7	< 2	1,750 ^b
n-Pentane	109-66-0	3.5	3.1	< 2	18,000 ^b
1-Pentanol	71-41-0	3.6	3.6	< 2	NA
alpha-Pinene	7785-70-8	34.0	47.7	2.2	1,700 ^c
beta-Pinene	19902-08-0	4.3	5.0	< 2	1,700 ^c
2-Propanol	67-63-0	2.1	< 2	< 2	9,800 ^b
Toluene	108-88-3	2.4	2.0	< 2	300 ^a
2,2,4-Trimethyl-1,3-pentanediol monoisobutyrate (Texanol isomers)	25265-77-4	9.6	8.2	< 2	65 ^c
2,2,4-Trimethyl-1,3-pentanediol diisobutyrate (TXIB)	6846-50-0	3.1	3.6	< 2	NA
Tris(1-chloro-2-propyl)phosphate (TCPP)	13674-84-5	6.6	< 2	< 2	NA
Unidentified Compound	--	2.8	2.9	< 2	NA

a.) OEHHA, Chronic Reference Exposure Levels (CRELs)

b.) 1% of Cal/OSHA permissible Exposure Levels (PELs)

c.) 0.5% of the DOE Protective Action Criteria 1 (PAC-1)

Indoor concentrations above maximum allowable concentrations are **bolded**. Below detection limit (<). NA=Not available. Chemicals emitted by SES Foam, Sucraseal, polyurethane spray foam highlighted in yellow.

SHERIFF'S ENTRY OF SERVICE

SC-85-2

Civil Action No. SU-19-CV-643Date Filed March 11, 2019

Peter H. Strott, Esq.
 Attorney's Address
 Strott & Dillon, Esq.
 Five Concourse Parkway, Suite 2600
 Atlanta, GA 30328

Superior Court
 State Court
 Juvenile Court

Georgia, Muscogee COUNTYSterling Cannon and Heather Cannon,

Magistrate Court
 Probate Court/1/2019 4:55 PM
 . DANIELLE F. FORTE, CLERK

Plaintiff

VS.

FoamOne, L.L.C.

Defendant

RECEIVEDAPR 29 2019

Garnishee

SHERIFF'S ENTRY OF SERVICE

PERSONAL

I have this day served the defendant Dale E. Looney (I.D.) personally with a copy of the within action and summons.

NOTORIOUS

I have this day served the defendant _____ by leaving a copy of the action and summons at his most notorious place of abode in this County.

CORPORATION

Delivered same into hands of _____ described as follows:
 age, about _____ years; weight _____ pounds; height, about _____ feet and _____ inches, domiciled at the residence of defendant.

NON EST

Served the defendant _____ a corporation
 by leaving a copy of the within action and summons with _____ in charge of the office and place of doing business of said Corporation in this County.

I have this day served the above styled affidavit and summons on the defendant(s) by posting a copy of the same to the door of the premises designated in said affidavit, and on the same day of such posting by depositing a true copy of same in the United States Mail, First Class in an envelope properly addressed to the defendant(s) at the address shown in said summons, with adequate postage affixed thereon containing notice to the defendant(s) to answer said summons at the place stated in the summons.

Diligent search made and defendant _____ not to be found in the jurisdiction of this Court.

This 29th day of April, 20 19 10:00 Am.

Hagan A. Brown
 Rec'd & Clerk

DEPUTY

SHERIFF DOCKET _____ PAGE _____